

Application No. 10/733,200  
Amendment dated February 24, 2004

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (currently amended) A method of multiplex transmission carried out by a multiplex transmission unit which is located between a low-speed transmission path and a high-speed transmission path, said method comprising the steps, of:

inserting an alarm into a predetermined location of the transport overhead of a multiplex signal of said high speed path; and

sending by through-transport the resulting multiplex signal to said high-speed path.

2. (new) A multiplex transmission apparatus connected to a plurality of first communication lines each transmitting a signal comprising of an overhead and a payload and to at least one second communication line capable of transmitting a signal at a speed higher than that of each of said first communication lines, the multiplex transmission apparatus comprising:

a plurality of first transceiver units each connected to one of said first communication lines for receiving a signal transferred on the first communication line and processing a first overhead extracted from the received signal;

a multiplexing and conversion unit for multiplexing at least payload portions of a

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plurality of signals received from said first transceiver units to generate a payload of a signal to be transmitted to said second communication line;

a second transceiver unit connected to said second communication line and said multiplexing and conversion unit for processing a second overhead to be transferred on the second communication line and transmitting a signal having the second overhead and the payload generated by said multiplexing and conversion unit to said second communication line; and

a control unit for controlling the whole operation of the multiplex transmission apparatus,

wherein said control unit instructs said second transceiver unit, when said first overhead, received by one of said first transceiver units, includes, at a predetermined location thereof, an alarm indication indicating that a failure occurs on one of said first communication lines, to add the alarm indication to said second overhead, and said second transceiver unit adds the alarm indication to a predetermined location of said second overhead in response to the instruction from said control unit, thereby to transmit a signal having the second overhead with said alarm indication to said second communication line.

3. (new) A multiplex transmission apparatus according to claim 2, wherein said predetermined location of said second overhead where said alarm indication is added resides in an undefined area having no authorized definition with respect to information

to be set therein.

4. (new) A multiplex transmission apparatus according to claim 3, wherein each of said first communication lines and said second communication line further comprise a pair including a working line and a protection line, and where said alarm indication gives a trigger for switching from the working line to the protection line.

5. (new) A multiplex transmission apparatus according to claim 3, wherein said alarm indication is automatic protection switching (APS) byte, and said second transceiver unit inserts a bit pattern into said undefined area at a predetermined location of said second overhead, at least three low-order bits of said bit pattern having an all "1" value.

6. (new) A multiplex transmission apparatus connected to at least one first communication line transmitting a signal comprising of an overhead and a payload and to a plurality of second communication lines each transmitting a signal at a speed lower than that of the first communication line, the multiplex transmission apparatus comprising:  
a first transceiver unit connected to said first communication line for receiving a signal transferred on said first communication line and processing a first overhead extracted from the received signal;  
a demultiplexing and conversion unit for demultiplexing at least a payload portion

of the signal received by said first transceiver unit to generate a plurality of signal payloads to be transmitted to said second communication lines;

a plurality of second transceiver units each connected to said demultiplexing and conversion unit and to one of said second communication lines for processing a second overhead to be transferred on the second communication line and transmitting the second overhead and at least a part of said plurality of signal payloads generated by said demultiplexing and conversion unit to the second communication lines; and

a control unit for controlling the whole operation of the multiplex transmission apparatus wherein said control unit instructs said second transceiver units, when said first overhead received by said first transceiver unit includes at a predetermined location thereof, an alarm indication indicating that a failure occurs on said first communication line to add the alarm indication to each of said second overheads, and each of said second transceiver unit adds the alarm indication to a predetermined location of the second overhead in response to the instruction from said control unit, thereby to transmit signals each having the second overhead with said alarm indication to said second communication lines.

7. (new) A multiplex transmission apparatus according to claim 6, wherein said predetermined location of said first overhead, where said alarm indication is included, resides in an undefined area having no authorized definition with respect to information to be set therein.

8. (new) A multiplex transmission apparatus according to claim 7, wherein each of said first communication line and said second communication lines further comprise a pair including a working line and a protection line, and said alarm indication gives a trigger for switching from the working line to the protection line.
  
9. (new) A multiplex transmission apparatus according to claim 7, wherein said alarm indication is automatic protection switching (APS) byte, and said control unit instructs said second transceiver units to add said alarm indication to said second overhead when a bit pattern is detected from said undefined area at a predetermined location of said first overhead, at least three low-order bits of said bit pattern having an all “1” value.